

What is claimed is:

1. A method of forming a polar liquid film on a surface of an organic film formed on a substrate, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the polar liquid to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere; and

an applying step of applying the polar liquid to the surface of the organic film processed by the modifying step.

2. The method according to claim 1, wherein the modifying step uses the rare gas atmosphere of a pressure of 1 torr or above.

3. The method according to claim 1, wherein modifying step applies a voltage of 20 kV or below to the electron-beam irradiation device.

4. The method according to claim 1, wherein the modifying step changes the pressure of the rare gas atmosphere while irradiating the organic film with electron beams.

5. The method according to claim 4, wherein the modifying step changes the pressure of the rare gas atmosphere from a first pressure to a second pressure higher than the first pressure.

6. The method according to claim 5, wherein the second pressure is 1 torr or above.

7. The method according to claim 1, wherein the modifying step changes the voltage applied to the electron-beam irradiation device while irradiating the organic film with the electron beams.

8. The method according to claim 7, wherein the voltage applied to the electron-beam irradiation device is changed from a first voltage to a second voltage lower than the first voltage.

9. The method according to claim 8, wherein the second voltage is 20 kV or below.

10. The method according to claim 1, wherein the modifying step changes both the pressure of the rare gas atmosphere and the voltage applied to the electron-beam irradiation device simultaneously while the organic film is being irradiated with the electron beams.

11. The method according to claim 1, wherein the organic film is a film of a compound containing silicon, carbon, hydrogen and oxygen.

12. The method according to claim 1, wherein the organic film is a methylsilsesquioxane film.

13. A method of forming an inorganic film on a surface of an organic film formed on a substrate, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the inorganic film to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere; and

an film forming step of forming the inorganic film on the surface of the organic film processed by the modifying step.

14. The method according to claim 13, wherein the modifying step uses the rare gas atmosphere of a pressure of 1 torr or above.

15. The method according to claim 13, wherein the modifying step applies a voltage of 20 kV or below to the

electron-beam irradiation device.

16. The method according to claim 13, wherein the modifying step changes the pressure of the rare gas atmosphere while irradiating the organic film with electron beams.

17. The method according to claim 16, wherein the modifying step changes the pressure of the rare gas atmosphere from a first pressure to a second pressure higher than the first pressure.

18. The method according to claim 17, wherein the second pressure is 1 torr or above.

19. The method according to claim 13, wherein the modifying step changes the voltage applied to the electron-beam irradiation device while irradiating the organic film with the electron beams.

20. The method according to claim 19, wherein the voltage applied to the electron-beam irradiation device is changed from a first voltage to a second voltage lower than the first voltage.

21. The method according to claim 20, wherein the second voltage is 20 kV or below.

22. The method according to claim 13, wherein the modifying step changes both the pressure of the rare gas atmosphere and the voltage applied to the electron-beam irradiation device simultaneously while the organic film is being irradiated with the electron beams.

23. The method according to claim 13, wherein the organic film is a film of a compound containing silicon, carbon, hydrogen and oxygen.

24. The method according to claim 13, wherein the organic film is a methylsilsesquioxane film.